WHAT IS CLAIMED IS:

1. A process for producing a silicon single crystal, comprising

pulling a silicon single crystal from a silicon melt which is contained in a crucible having a crucible wall and having a crucible diameter of at least 450 mm,

placing a heat shield above said crucible; and said silicon single crystal being pulled with a diameter of at least 200 mm; and

exposing the silicon melt to an influence of a traveling magnetic field which exerts a substantially vertically oriented force on the melt in a region of the crucible wall.

2. The process as claimed in claim 1,

wherein the silicon single crystal is pulled with an oxygen concentration of at least $5 * 10^{17}$ atoms per cm^3.

3. The process as claimed in claim 1,

wherein the traveling magnetic field exerts a force on the melt which is primarily directed vertically downward at the crucible wall.

4. The process as claimed in claim 1,

wherein the traveling magnetic field exerts a force on the melt which is primarily directed vertically upward at the crucible wall.

5. An apparatus for pulling a silicon single crystal comprising

a crucible having a crucible wall and a crucible diameter of at least 450 mm;

a silicon melt which is contained in the crucible;

a heater device located around the crucible;

a heat shield located above the crucible; and

a device for generating a traveling magnetic field which, in a region of the crucible wall, exerts a substantially vertically oriented force on the melt.

6. The apparatus as claimed in claim 5,

wherein the device which generates the traveling magnetic field is located around the crucible and is further away from the crucible than the heater device.

7. The apparatus as claimed in claim 5,

wherein the device which generates the traveling magnetic field is located around the crucible and is closer to the crucible than the heater device.

8. The apparatus as claimed in claim 5,

wherein the device for generating the traveling magnetic field comprises at least two coils.

9. The apparatus as claimed in claim 5,

wherein the device for generating the traveling magnetic field exerts a force on the melt which is primarily directed vertically downward at the crucible wall.

10. The apparatus as claimed in claim 5,

wherein the device for generating the traveling magnetic field exerts a force on the melt which is primarily directed vertically upward at the crucible wall.

11. An apparatus for pulling a silicon single crystal, comprising

a crucible having a crucible wall and a crucible diameter of at least 450 mm;

a silicon melt which is contained in the crucible;

a heater device located around the crucible, and said heater device being a helical multiphase inductor;

a heat shield located above the crucible; and

the heater device generating a traveling magnetic field which, in a region of the crucible wall, exerts a substantially vertically oriented force on the melt.

12. The apparatus as claimed in claim 11,

wherein the heater device generating the traveling magnetic field exerts a force on the melt which is primarily directed vertically downward at the crucible wall.

13. The apparatus as claimed in claim 11,

wherein the heater device generating the traveling magnetic field exerts a force on the melt which is primarily directed vertically upward at the crucible wall.